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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,816	10/30/2003	Timothy A. Rost	TI-35257	1301

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EXAMINER

CRANE, SARA W

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,816

Applicant(s)

ROST ET AL.

Examiner

Sara W. Crane

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiba et al., Dunaway et al, or Grzyb et al.

Each of the references shows a capacitor on a chip located over a topmost metal interconnect. See Shiba et al., figure 1, where the top three layers 7, 6, 5, form a capacitor. Dunaway et al., figured 15B, shows capacitor 169 on chip 178. Grzyb figure 5 shows at 45 or 46 an "additional thick oxide capacitor that provides additional decoupling capacitance" (column 3, lines 42-44), which lies above the other layers. It would have been obvious that all of these capacitors provide a de-coupling function, because capacitors smooth out voltage fluctuations to decouple the circuits on the chips from fluctuations in the external voltage. Grzyb refers to decoupling capacitors explicitly (abstract).

Claims 2-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsuki in view of Saito et al, and also in view of Urdahl et al., Kar-Roy et al, and Armacost et al.

With respect to claim 2, figure 9 of Ohtsuki shows a lower interconnect level 6 over a semiconductor body. It would have been obvious to make the layer of metal, for example tungsten (column 2, lines 50-51) to achieve conductivity and heat resistance. A topmost layer comprises first line 8 and second line 7, with metal again obvious (and usual in the art) for conductivity. Bottom electrode 10 is over first line 8, capacitor dielectric 11 is over the bottom electrode, and top electrode 12 is over the dielectric. Saito et al. teaches at column 2, lines 30-33, to connect the plate line of a memory cell of the memory cell to ground voltage, to form dummy cells to protect internal cells. It would have been obvious to connect the plate 10 of an Ohtsuki cell to ground, and the bit line 8 of the cell to ground for the reason taught by Saito et al. The two lines would be "in electrical contact," because both would be at ground potential.

With respect to claims 3-4, Ohtsuki shows a "cap layer" 15, 16, 14, which connects the top electrode and second line 7. Metal would have been obvious to obtain high conductivity needed for wiring. Aluminum is included (column 10, lines 23-25). Each of the other three references is relied upon for teaching of specific materials as set forth in the other claims. Urdahl et al. teaches a TaN capacitor electrode (column 8, last line) and tantalum oxide dielectrics (abstract), with each material obvious to use in the Ohtsuki capacitor in order to obtain the known properties of conductivity for an electrode, and dielectric constant for a dielectric. Hafnium oxide and silicon nitride for capacitor dielectric are taught at Kar-Roy et al. column 3, lines 20-25, each obvious to obtain the known dielectric constant. The top-most layer 126 of the Kar-Roy device can be aluminum (column 4, lines 58-59), obvious in order to obtain the high conductivity of

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aluminum. Copper interconnect levels are taught by Armacost et al. (column 4, line 33), obvious to use as an interconnect material to obtain the known conductivity properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (571) 272-1652.

The supervisor for Art Unit 2811, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sara W. Crane
Primary Examiner
Art Unit 2811